

ICAR Briefing
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February 19, 2002
9th Circle D0 Portakamp #15

See attached letter from Finley to HEPAP sub-panel delivered during Snowmass 2001.

Need all three of the following:

RESEARCH PROJECTS OPERATIONS

Opportunities

I've been asked to prepare an FY03 budget which is about twice the FY02 level.

The Technical Division has a new Head (Bob Kephart).

= FNPL (aka A0 Photoinjector) --- >>> Injector III (Pi3)

Real beam physics

Real beam

= LC (NLC . TESLA) (XBand . srf)

Making, understanding and specifying linac structures

Beam physics

Damping rings

Main Linacs

Engineering (In particular: RF aka Microwave aka Electrical Engineering)

= Etc ... including muon beams

Aside: In response to a question I was asked what the FY03 funding level is expected to be. I answered that I was asked to prepare a plan for about \$11M, but was told that \$11M in February often turns out to be closer to \$6M in October. The FY02 level is close to \$4.5M for all rf R&D and LC R&D at Fermilab which includes about \$3M in NLC capped funds.

July 19, 2001

Dear HEPAP Sub-Panel Members:

Thirty years from now it would be good if our science will be as exciting to a twenty-five year old budding physicist as it was for me in 1972. For me, the basis for the excitement is the opportunity to explore the answers to simple sounding questions like:

“What is it all made of?” and “How does it all interact?”

A large part of the excitement is based on the opportunity to actually get at parts of the answers in a time period of three or four years, as appropriate for a student or a junior scientist. And part of the excitement is knowing you are a member of a group that is the best there is, you are making a significant contribution, and you are getting better.

The best physicists have a perspective on science that is broadly rather than narrowly defined. And this is one way our science is able to progress, and why it continues to be exciting. In particular, the two fundamental questions in the first paragraph have spawned other derivative questions when measurements and observations are combined with theories of how it could be. These include:

“How is it we observe more matter than antimatter?” and

“How is it that some particles appear with mass and others don’t?” and

“How is it all distributed anyway, and how does the distribution change?”

Some of the various pursuits within our science are called particle physics, astroparticle physics, or cosmology. At this time, for me, they are all part of the mix. And the evolution of the questions is part of the continual excitement.

Meanwhile, our science has come to the point where we are accustomed to contemplating decade-or-more long projects to take the next significant steps. And the resulting facilities will likely be operated and improved for an even longer time. Projects and operations are necessarily focused on rather specific missions, and they rarely offer opportunities for fundamental or exploratory research unrelated to development or improvements. My oral presentation earlier this week to the sub-panel on the A0 Photoinjector described one opportunity, a successful opportunity if one considers the number of PhD students it has recently graduated: four PhD students in about as many years. There are other opportunities, of course, but not many.

In my experience, the resources required for fundamental beam physics research require vigilant and benevolent protection by managers with enough clout to do so. When push comes to shove – whether from above or below - in conflicts between research and projects or operations, research will nearly always lose out. This is often the appropriate and responsible behavior for the short term, but can also be unwise in the long term. One needs a balanced mix of the three if we are to make progress efficiently.

This is the basic point I want to make to the sub-panel: The opportunities for people to enter into our science and to progress in their careers must be nourished, and a balance of accelerator physics research, projects and operations should be supported and encouraged. Then the excitement and progress will likely continue.

Respectfully,
David Finley / Fermilab